

## **NACELLE INTEGRATION WITH REFLEXED WING FOR SONIC BOOM REDUCTION**

John M. Morgenstern

Alan E. Arslan

Josh P. Barbieri

### **ABSTRACT**

A method for integrating an engine nacelle below the wing of a supersonic aircraft with low sonic boom capabilities includes determining the shape of a reflexed portion of the airfoil on the underside of the wing, and a corresponding shape for the upper surface of the nacelle to provide favorable interaction between the wing and the nacelle. In some configurations, the reflex and/or the nacelle are shaped to maintain positive pressure under the reflexed portion of the wing, to the trailing edge of the wing. A gull dihedral wing is designed to form a partial shroud around the nacelle. Such configurations reduce drag at the trailing edge of the wing, and the force of the positive pressure on the gull dihedral wing portion provides additional lift that partially offsets drag from the nacelle.